Seattle Public Utilities – Natural Drainage System Program

Problem Statement: Seattle's receiving waters and aquatic life have been significantly impaired by the negative impacts of urban stormwater runoff. Increasing volumes of runoff also cause flooding of roadways and property. Traditional methods of stormwater management and street design have proven to be ineffective at countering the impacts of current and future development on receiving waters.

Natural Drainage Systems (NDS) is an alternative stormwater management approach that delivers higher levels of environmental protection for receiving waters at a lower cost than traditional street and drainage improvements.

- NDS targets areas of the city draining to creek watersheds that do not currently have formal drainage or street improvements.
- NDS design is based on technology that emphasizes infiltration and decentralized treatment of stormwater to reduce the total volume of runoff reaching creek systems.
- The goal of NDS is to more closely match the hydrologic function of natural forests that existed prior to development, thereby creating stable creek systems and clean water.
- NDS designs cost less than traditional drainage and street designs.

Cost Analysis of Natural vs. Traditional Drainage Systems Meeting NDS Stormwater Goals

Street Type	***Local street*** **SEA Street**	***Local street*** **Traditional**	***Collector street*** **Cascade**	***Collector street*** **Traditional**	**Broadview Green Grid** 15 block area
Community Benefits	▪ one sidewalk per block ▪ new street paving ▪ traffic calming ▪ high neighborhood aesthetic	▪ two sidewalks per block ▪ new street paving ▪ no traffic calming ▪ no neighborhood aesthetic	▪ no street improvement ▪ moderate neighborhood aesthetic	▪ no street improvement ▪ no neighborhood aesthetic	▪ both 'SEA Street' and 'Cascade' types ▪ one sidewalk per block ▪ new paving ▪ high neighborhood aesthetic
Ecological Benefits	▪ high protection for aquatic biota ▪ mimics natural process ▪ bio-remediate pollutants	▪ high protection from flooding ▪ some water quality	▪ high water quality protection ▪ some flood protection	▪ high protection from flooding ▪ some water quality	▪ high water quality & aquatic biota protection ▪ some flood protection ▪ excellent monitoring opportunity
% impervious area	35%	35%	35%	35%	35%
Cost per block (330 linear feet)	$325,000	$425,000	$285,000	$520,400	Average per block: $280,000